

REVISION OF THE *SPHENOMORPHUS RICHARDSONII*
SPECIES-GROUP (LACERTILIA, SCINCIDAE)

G. M. STORR

ABSTRACT

Two species are recognized, *S. richardsonii* (Gray) and *S. fasciolatus* (Günther), neither of which is divisible into subspecies. *Hinulia pallida* Günther is synonymized with *S. fasciolatus*.

INTRODUCTION

In an earlier paper (Storr 1967) I had difficulty in setting taxonomic limits to certain forms of *Sphenomorphus*, viz. *richardsonii*, *fasciolatus* and *pallidus*. In the south of the Northern Territory *S. fasciolatus* showed some morphological approach towards *S. richardsonii*, and in the far north it showed a marked approach towards *pallidus*. Yet the end members of this sequence, *richardsonii* and *pallidus*, occurred in the Pilbara region of Western Australia with no indication of interbreeding. Clearly the complex comprised at least two species. I tentatively drew the specific boundary between *S. richardsonii* and *S. fasciolatus*, relegating *pallidus* to a subspecies of *S. fasciolatus*.

A little later, through the courtesy of Lt Cdr A. Y. Norris, I was able to examine the collections made by the British Joint Services Expedition to the southwest of the Northern Territory. In the Petermann Range the Expedition collected three specimens of *S. richardsonii*. On Armstrong Creek (only 33 miles east of the easternmost *S. richardsonii*) they collected a *pallidus*. About 100 miles further east, at Curtin Springs and Mt Conner, seven specimens were collected of what I took to be "*fasciolatus* tending towards *richardsonii*".

It thus became necessary to re-assess the characters used for separating *S. richardsonii* from *S. fasciolatus* and above all to extend the study to eastern Australia. Specimens were borrowed from the eastern States, where both species are apparently rare. Though this eastern material is scanty and often so old as to retain little or no colour pattern, it confirms my original division of the complex into two species. It has, however, become fairly certain that "*pallidus*" is no more than an ecotypic variant of *S. fasciolatus* which may crop up anywhere in the sandier parts of the latter's range.

For the loan of specimens I am grateful to Dr E. R. Pianka, University of Texas (numbers prefixed with ERP); Mr B. L. Bolton, Northern Territory Administration, Alice Springs (NTM); the late Mr F. J. Mitchell, South Australian Museum (SAM); Miss J. M. Dixon, National Museum of Victoria (NMV); Dr F. H. Talbot, Australian Museum, Sydney (AM); and Miss J. Covacevich, Queensland Museum (QM). The prefixes WAM and JSE refer to specimens in the Western Australian Museum and the collections of the British Joint Services Expedition.

Sphenomorphus richardsonii

- Hinulia richardsonii* J. E. Gray, 1845, Catalogue of the specimens of lizards in the Collection of the British Museum, p. 271. Houtman Abrolhos, Western Australia (B. Bynoe).
Lygosoma monotropis G. A. Boulenger, 1887, Catalogue of the lizards in the British Museum (Natural History). 2nd ed. 3: 237. Champion Bay, Western Australia (F. H. du Boulay).
Hinulia ambigua C. W. De Vis, 1888, Proc. Linn. Soc. N.S.W. (2) 2: 817. Charleville, Queensland.

Distribution.—Western Australia, except far north and deep southwest; far southwest of Northern Territory; South Australia, except Eyre Peninsula and southeast; southern Queensland, except humid southeast; northern two-thirds of New South Wales, east to the western slopes of the Great Dividing Range.

Diagnosis.—Very similar to *S. fasciolatus* but caudal bands fewer (19–32, v. 35–40), wider and less regular (often oblique and branching). Dorsal pattern generally stronger: dark bands usually fewer (8–14, v. 10–19) and wider (up to as wide as interspaces), sharper-edged and more strongly contrasting with pale ground colour. Tail longer (131–171% of snout-vent length, v. 114–142).

Geographic variation.—In my previous paper six Western Australian populations were briefly characterized. Here another six are analyzed from further east.

Southwest of Northern Territory: Ruined Ramparts, Petermann Range (JSE 172); Hull River (JSE 149); Shaw Creek (JSE 134). Differs from the neighbouring “Northeast” population of Western Australia by having more scale rows (33–34, v. 29–32), more dorsal bands (10–13, v. 9–12) and more caudal bands (32, v. 24–26). Observe that these divergences are all in the direction of *fasciolatus* from the immediate north and northeast. Two tailless specimens from Charlotte Waters (NMV 3381, 3392) possibly belong here; they have 34 scale rows and 9–12 dorsal bands.

Western interior of South Australia: Ooldea (WAM 2270; SAM 678; NMV 390, 396–7); Immarna (SAM 689); “Overland Railway” (NMV 2647, 2661, 2670, 2672); Wynbring (SAM 696, 712, 9400–4). Generally like the “Eastern” population of Western Australia, with which it shares high frequency of 2 (rather than 3) supraoculars in contact with frontal (56%) and numerous lamellae under fourth toe (24–29, av. 26·7). The frequency of specimens with frontal not clearly longer than frontoparietal plus interparietals is high (44%); and, as in other South Australian populations, more than half the specimens have the frontoparietal longer than interparietals. The number of scale rows is extremely low (28–32, av. 29·8). Labials mostly 8 (7 in four specimens). Supraciliaries 7–9 (mostly 8). Dorsal bands 8–11 (av. 9·6) and, as in all populations east of the Western Australian border, considerably narrower than interspaces.

Eastern interior of South Australia: Lambina (NTM 1553–4); Muloorinna (SAM 3708); Alicoota-Angepena (SAM 5357); Mern Merna (SAM 2649); Lake Gilles (SAM 4981). Generally similar to preceding population but has fewer lamellae (21–26, av. 23·8) and a tendency for hindlegs to be cross-banded; it may also be larger (SVL up to 93, v. 77). Labials and supraciliaries 8. Dorsal bands 9–14; but only the northernmost (Lambina) specimens have more than 11, in which respect they agree with nearby Northern Territory specimens.

Central districts of South Australia: Tarlee (SAM 2763); South Hummocks (SAM 1693, 9394); Price (SAM 9395); Curramulka (SAM 5775, 9393); Port Vincent (SAM 4065); Portee (SAM 8585). Agrees with the next and differs from two preceding populations in the numerous scale rows (31–36, av. 33·3). As in all populations east of the Western Australian border, about half the specimens have only 2 supraoculars in contact with frontal. Both specimens from South Hummocks exhibit a trait which becomes more frequent further east, viz. 3 secondary temporals (rather than 2), which results in the last labial being much smaller than the penultimate. Labials 8. Supraciliaries 8 (except one specimen with 7). Lamellae 21–26 (av. 23·2). Dorsal bands 9–11 (av. 10·3).

New South Wales: Mt Brown (AM 900); White Cliffs (AM 12573); Inverell (AM 13285); Nyngan (AM 11793, 12532); Darlington Point (AM 7276–7). Generally similar to the preceding population but has fewer dorsal bands (8–10, av. 9·0), more labials and supraciliaries (both usually 8, occasionally 9) and fewer lamellae (20–25, av. 22·3). All but the specimens from White Cliffs and Inverell have 3 secondary temporals. Scale rows 32–36 (av. 33·1). Caudal bands 22–29 (av. 25·0).

Queensland: Port Curtis (AM 6384); Waratah, near Cunnamulla (QM 11984). These specimens differ from the New South Wales series in having fewer scale rows (31 and 32 respectively), labials (8 and 7) and supraciliaries (7 and 6/7). Both have 23 lamellae, 3 supraoculars in contact with frontal, and only 2 secondary temporals. The Waratah specimen has more dorsal bands (13) and caudal bands (30); but the Port Curtis specimen has only 8 dorsal bands.

Sphenomorphus fasciolatus

Hinulia fasciolata A. Günther, 1867, Ann. Mag. nat. Hist. (3) 20: 47. Rockhampton and Port Curtis, Queensland (G. Krefft).

Hinulia pallida A. Günther, 1875, in J. Richardson & J. E. Gray's Zoology of H.M.S. Erebus & Terror, 2: 12. Nickol Bay, Western Australia (F. H. du Boulay).

Lygosoma (Hinulia) fasciolatum intermedium R. Sternfeld, 1919, Senck. biol. 1: 81. Hermannsburg, Northern Territory (M. von Leonhardi).

Distribution.—Arid zone of the western two-thirds of Australia; Western Australia (north of the Tropic), Northern Territory (north to Larrimah), northeastern South Australia, far southwestern Queensland, western New South Wales and far north-western Victoria; and subhumid zone of mid-eastern Queensland.

Diagnosis.—Distinguishable from *S. richardsonii* by caudal bands more numerous (35–40, v. 19–32), narrower and more regular (usually one scale wide, perfectly transverse, and separated by interspace of two scales). Dorsal pattern weaker: dark bands usually more numerous (10–19, v. 8–14) and much narrower than interspaces, often breaking mid-dorsally and not so much darker than ground colour. The last two tendencies, singly or combined, may produce a skink with little or no trace of dorsal bands. Usually in these paler variants (“*pallidus*”) the caudal bands are discernible and the darker dorsum is well defined from the white venter; but in what appears to be an extreme ecotype (the “Ghost Skink” of Lake Eyre) pigments are completely absent.

Geographic variation.—Six populations are analyzed, beginning with the typical population. The “Ghost Skink” is left to last; being colourless, it is not certainly identifiable with this species.

Mid-eastern Queensland: Port Curtis (QM 1837; AM 6382–3); Burnett River (AM 5334). Dorsal bands (where still discernible) very narrow; 15 in the single specimen (AM 5334) where they can be counted. Labials 8. Supraciliaries 8 (one specimen with 9). Frontal in contact with 2 or 3 supraoculars. Scale rows 33–35. Lamellae 17–20 (av. 18.0). SVL up to 98. All specimens have 3 secondary temporals and small last labial; this trait, common in southeast Australian *richardsonii*, was not observed in other populations of *fasciolatus*.

Arid interior of eastern Australia. NORTHERN TERRITORY: Ayers Rock (NMV 8191); Curtin Springs (JSE 16a–c, 52a–b); Mt Conner (JSE 63a–b; ERP 9772); Horseshoe Bend (ERP 9899); Charlotte Waters (NMV 528–9). NO PRECISE LOCALITY: “Central Australia” (NMV 889, 1187–90, 1458). SOUTH AUSTRALIA: Killalpaninna (SAM 9407–12); Mulka (NMV 155); Kings Lookout (SAM 8738). QUEENSLAND: 14 mi. N of Fortville Tank (NMV 11995–6). NEW SOUTH WALES: Menindee (SAM 8737). VICTORIA: Mildura (NMV 9846). Dorsal bands usually present, 10–17 (av. 13.0). Caudal bands 37–40. Labials 8 (rarely 7 or 9). Supraciliaries 7 or 8 (rarely 6). Frontal in contact with 2 or 3 supraoculars. Scale rows 28–33 (av. 30.3). Lamellae 22–30 (av. 25.0).

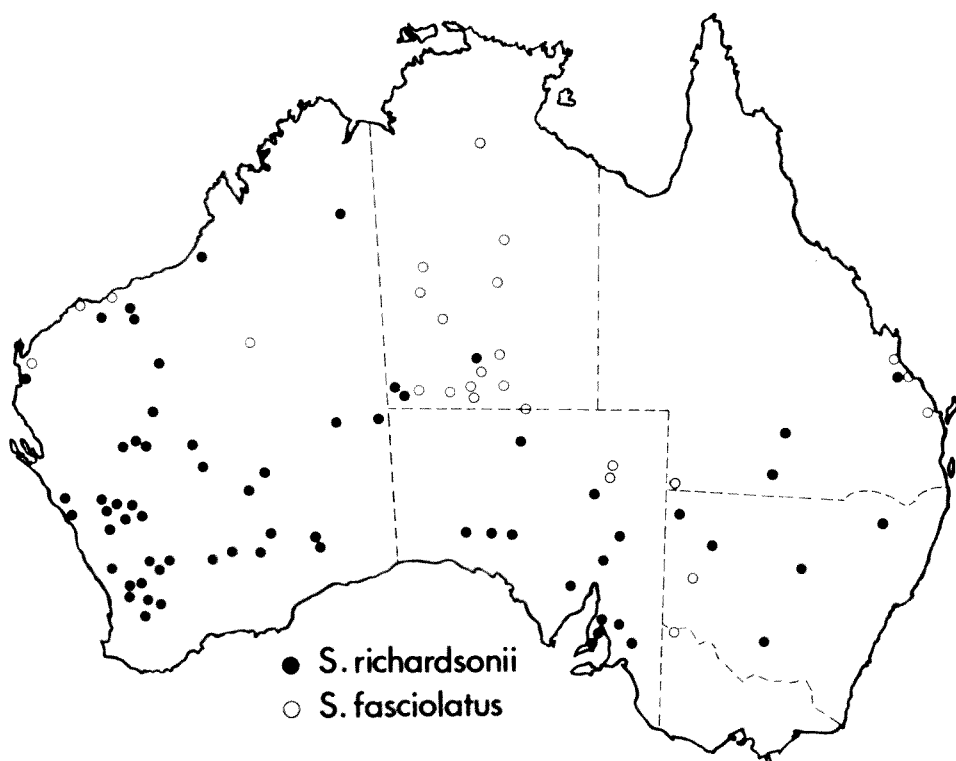
Central highlands of Northern Territory: Tennant Creek (SAM 6134, 9396–9; NMV 2909, 2917, 2924, 2936–7); Renahans Well (ERP 11627); Horn Camp XXV (NMV 286); Illamurta (NMV 455, 457, 467); Armstrong Creek (JSE 99); plus 14 specimens listed in Storr (1967: 14–15). Generally similar to preceding population

but smaller (SVL up to 87, v. 93), tail longer (120–142% of SVL, av. 134; v. 114–135, av. 128), fewer labials (usually 7, seldom 8), fewer supraciliaries (usually 7, seldom 6 or 8, rarely 9), more scale rows (30–36, av. 33·3) and fewer lamellae (20–28, av. 23·4). Dorsal bands 10–17 (av. 13·1). Caudal bands 35–40. Frontal in contact with 2 or 3 supraoculars.

Northern interior of Northern Territory: Larrimah (WAM 24144–5). Differs from preceding population in having more dorsal bands (17–19) and fewer lamellae (18–22).

Northwest of Western Australia: Mundabullangana (WAM 17060, 26762–4); between the Ashburton and Gascoyne Rivers (SAM 9406); Well 24, Canning Stock Route (WAM 27025). Generally similar to last two populations, between which it is intermediate in number of dorsal bands (13–17, av. 15·6). Labials 7. Supraciliaries 7 (8 in one specimen). Frontal in contact with only 2 supraoculars. Scale rows 30–34 (av. 32·0). Lamellae 21–26 (av. 23·0). In all specimens the dorsal pattern is weakly developed (“*pallidus*”).

Lake Eyre, South Australia: Prescott Point, Madigan Gulf (SAM 3335, 3370, 9333, 9405); Emu Camp (NMV 1106–7). Labials 8 (7 in one specimen). Supraciliaries 7 (6 in one specimen). Frontal usually in contact with 3 supraoculars, occasionally 2. Scale rows 28–30 (av. 29·5). Lamellae 23–25 (av. 23·7). SVL up to 88. Tail 127% of SVL (one specimen). All specimens are colourless (“Ghost Skinks”).



Map of Australia showing location of specimens of *Sphenomorphus richardsonii* and *S. fasciolatus*
Drawn by Miss Kim Cannon

DISCUSSION

The distribution of *S. fasciolatus* overlaps that of *S. richardsonii* in the Pilbara region of Western Australia and, if old labels are trusted, also at Port Curtis, Queensland. In western New South Wales *S. richardsonii* has been collected in hilly country (Mt Brown and White Cliffs); while *S. fasciolatus* has been collected in the surrounding lowlands (Menindee and near Fort Grey). In the southwest of the Northern Territory, *S. richardsonii* occurs on the upper courses of creeks flowing north from the Petermann Range; whereas a few miles further down one of these creeks *S. fasciolatus* has been collected (where the Armstrong loses itself among the sand dunes south of Lake Amadeus).

The two species are well differentiated only in the Pilbara. There they are distinguishable on several characters, including the much greater size of *S. richardsonii*. On the opposite side of Australia differences between the species are much less marked, and the representative populations of each form share a character not observed elsewhere in either species, namely three secondary temporals and small last labial. In the centre of the continent the species approach each other in so many characters that one can only conclude that gene-flow has not long ceased between them. Because of this, it is not easy to identify Central Australian specimens lacking a tail or from which all colour has faded.

This brings us to the identity of the "Ghost Skink" of Lake Eyre (photographed in Worrell 1963, p. 16). In this region size, proportions and meristics are much the same in both species. However, in relative length of tail and number of supraciliaries the "Ghost Skink" agrees better with *S. fasciolatus* than *S. richardsonii*. A more cogent reason for aligning it with *S. fasciolatus* is now discussed.

Throughout its range, *S. richardsonii* undergoes little or no ecotypic variation. The "western interior" population of South Australia inhabits the southeastern tongue of the Great Victoria Desert. The "eastern interior" population of South Australia occupies a very different habitat: the vicinity of watercourses in stony tableland country. Yet, as we have seen, differences between these populations are slight. Wherever *S. richardsonii* shows any substantial departure from normal, as in the southwest of the Northern Territory or in far northern South Australia, it is correlated not with habitat but with geographic proximity to *S. fasciolatus*.

S. fasciolatus is much more plastic. On hard soils it tends to have a moderately strong pattern and to be similar in habitus to *S. richardsonii*. In sandy country it tends to lose pattern and to develop a depressed snout (as in "*pallidus*"). It is thus easier to believe that *S. fasciolatus*, rather than *S. richardsonii*, should have evolved such an extreme ecotype as the "Ghost Skink".

REFERENCES

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